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REMARKS

In the Final Office Action of June 15, 2005, claims 1-20 are pending. Claims 1, 14, and 20 are independent claims from which all other claims depend therefrom. Claims 1 and 20 are herein amended. Note that claims 1 and 20 are not herein amended for patentability reasons. Applicants, respectfully, request that should an Advisory Action be deemed appropriate that the amendments be entered since they do not raise new issues that would require further consideration.

Claims 1-18 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shyu (U.S. Patent No. 5,091,726) in view of Schofield et al. (U.S. Patent No. 6,498,620).

Amended claim 1 recites a vision-based object detection system for a vehicle that includes multiple vision sensing systems. The vision sensing systems include a frontal collision sensing system and one or more vision receivers and generate an object detection signal. A controller has multiple sensing system aid modules that correspond to each of the vision sensing systems. The controller selects and operates at least one of the sensing system aid modules in response to a vehicle parameter. The sensing system aid modules and each of the receivers have multiple associated active operating modes. The sensing system aid modules operate the vision sensing systems in one or more of the operating modes in response to the vehicle parameter.

The system of claim 1 provides a single sensing system with a single controller that has multiple sensing system aid modules. The controller utilizes the sensing system aid modules in association with multiple sensing system active operating modes. Also, the sensing system aid modules share the vision receivers in performing tasks associated with the multiple operating modes. In so doing, the system of claim 1 minimizes the number of components associated with and the complexity of the sensing systems of a vehicle.

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Previously presented claim 1 recited the limitations of multiple vision sensing systems having one or more vision receivers and multiple sensing system aid modules that correspond to each of the sensing systems. Thus, the sensing system aid modules correspond to each of the vision receivers. The previously presented claim 1 also recited the limitations of the sensing system aid modules having multiple operating modes. Thus, the vision receivers also have multiple operating modes. Claim 1 is herein amended to expressly clarify that the vision receivers each have multiple active operating modes.

The claimed invention operates the vision systems and the vision receivers based upon the one or more vehicle parameters and the selected sensing system aid module. The selected sensing system aid module thus dictates the operating state or mode of the vision systems and vision receivers. Each mode of operation may have different associated factors, such as operating accuracy, update rate, monitored areas and/or distances, types of objects monitored, etc.

The Office Action states that Shyu disclosed a plurality of sensing systems 111, 112, 121, and 122 comprising a frontal collision sensing system and having at least one receiver. Applicants, respectfully, traverse. The devices referred to by numerical designators 111, 112, 121, and 122 are not sensing systems, but are rather sensing elements. The sensing elements 111, 112, 121, and 122 do not include a frontal collision sensing system, but are part of an obstacle sensing system. The obstacle sensing system includes the sensing elements 111, 112, 121, and 122 and a computer 3. The sensing elements 111, 112, 121, and 122 do not include a receiver, but rather are the receivers. Quite simply, Shyu discloses a single obstacle sensing system having multiple sensing elements 111, 112, 121, and 122.

The Office Action further states that Shyu discloses a plurality of sensing system aid modules corresponding to each of the plurality of sensing systems. Again Shyu fails to disclose multiple sensing systems. Applicants also submit that Shyu fails to disclose multiple sensing system aid modules, especially as claimed and in view of the specification of the present application. Shyu

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discloses a computer 3 that includes multiple modules 31-35. The modules 31-35 do not aid in the operation of the obstacle sensing system or in the operation of the sensing elements 111, 112, 121, and 122 with respect to object sensing, but rather are used solely in performing a countermeasure, such as distance indication, braking, head-light control, and cruise control. The modules 31-35 do not control what is monitored by or inputted into the computer 3, but rather control how countermeasures are performed. The modules 31-35 do not dictate the operating mode of the obstacle sensing system or of the sensing elements 111, 112, 121, and 122.

It is understood in view of the present application that a module may be both a sensing system aid module and a countermeasure module. For example, the lane-keeping aid module 46 of the present application is both a countermeasure module and a sensing system aid module in that it both dictates the operation of the vision receivers 20, such as the zone of coverage, and is used to perform countermeasures. Example countermeasures for the lane-keeping module 46 are the warning of a vehicle operator and the maintaining of a vehicle in a particular lane. The modules 31-35, on the other hand, are solely used to perform countermeasures.

Applicants also understand that limitations from the specification should not be read into the claims. However, Applicants submit that the claims ought to be construed in light of the specification. In reviewing the limitations of claim 1 and the specification, one would clearly not interpret the term "sensing system aid module" as a module that is designed solely to perform countermeasures, as disclosed in Shyu. Such an interpretation would not be consistent with the specification of the present application.

The Office Action further states that Shyu discloses a plurality of sensing system aid modules that have a plurality of active operating modes. One may argue that the modules 31-35 of Shyu in combination have multiple operating modes. However, each of the modules 31-35 does not have multiple operating modes, but rather a single active operating mode. As a couple of examples, the

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brake light actuator 41 is either active or inactive or the deceleration reminder 421 is either ON or OFF. In addition, as stated above, the countermeasure modules 31-35 are not sensing system aid modules.

The Office Action recites a detecting mode, a warning mode, and a control mode. Note that these modes are not expressly called out anywhere in Shyu. Since these modes are not recited in Shyu, Applicants assume that the Examiner is referring to the operating modes of the modules 30, 31, and 32 of Shyu. The detecting mode may be considered a single active operating mode of a single module, specifically module 30. Also, the warning mode may be considered a single operating mode of possibly module 31 or module 32. Applicant is unsure what the Office Action is referring to when it states a control mode. Thus, each mode recited in the Office Action is a single mode associated with only a single module. The modes are not associated with the operating state of the elements 111, 112, 121, and 122.

Applicants, as stated in the previous Response of March 2, 2005, submit that the system of Schofield operates in a single active mode. Applicants also stated that Schofield, like Shyu, discloses a processor that does not include multiple sensing system aid modules. Also, nowhere in Shyu or Schofield is it stated that the processors thereof select or operate multiple sensing system aid modules, as claimed. Furthermore, neither Shyu nor Schofield discloses vision receivers or any object detection sensors that each operates in multiple active operating modes.

Claim 14 recites the limitations of a method of performing multiple sensing system aids for a vehicle. The method includes generating an object detection signal via multiple vision sensing systems. Sensing system aid modules, which include a parking-aid module, correspond with each of the vision sensing systems and are operated via a single controller.

As stated, neither Shyu nor Schofield teach or suggest the use of multiple vision sensing systems. Moreover, neither Shyu nor Schofield teach or suggest a parking-aid module or the use of a parking-aid module, see below with respect to

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the rejection of claim 20. Shyu is solely concerned with preventing collisions between vehicles on a highway. Schofield discloses the monitoring of an area rearward of a vehicle while moving in a forward direction. Both Shyu and Schofield do not mention parking, tasks performed during parking, or a module that performs such tasks.

Claim 20 recites a vision-based object detection system for a vehicle. The system includes multiple vision sensing systems operating simultaneously in multiple modes selected from a reversing-aid mode, a parking-aid mode corresponding to both frontal and rearward detection, a frontal pre-collision sensing mode, a lane departure aid mode, and a lane-keeping aid mode. The system also includes a single vision processor that has multiple sensing system aid modules.

Applicants have shown that Shyu, like Schofield, fails to teach or suggest multiple vision sensing systems and thus also fails to teach or suggest the simultaneous operation thereof and in modes recited in claim 20. Applicants have also shown that Shyu and Schofield fail to teach or suggest multiple sensing system aid modules.

The Office Action states that the rejections of claims 14-20 recite the rejection of claims 1, 8, and 9, except they are method claims. Applicants submit that claims 14 and 20 have limitations that are novel and that are not recited in claim 1, 8, or 9. Applicants submit, with respect to claim 14, that claims 1, 8, and 9 do not recite the limitations of a parking-aid module. Applicants also submit, with respect to claim 20, that claims 1, 8, and 9 do not recite the limitations of operating multiple vision sensing systems simultaneously or in multiple modes, the selection of modes from a reversing-aid mode, a parking-aid mode corresponding to both frontal and rearward detection, a frontal pre-collision sensing mode, a lane departure aid mode, and a lane-keeping aid mode. A reversing-aid mode, a parking-aid mode, a frontal pre-collision sensing mode, a lane departure aid mode, and a lane-keeping aid mode are not recited in claims 1, 8, or 9.

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Referring to MPEP 706.02(j) and 2143, to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claim limitations, see *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Thus, since Shyu and Schofield alone or in combination fail to teach or suggest each and every element of claims 1, 14, and 20, Applicants submit that claims 1, 14, and 20 are novel, nonobvious, and are in a condition for allowance. Also, since claims 2-13 and 15-18 depend from claims 1 and 14, respectively, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claim 19 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Shyu in view of Schofield and further in view of Okamoto (U.S. Patent No. 6,587,760).

Claim 19 depends from claim 14, which Applicants have shown to be allowable. Claim 19 is allowable for at least the same reasons as put forth above for claim 14.

The Office Action states that Shyu and Schofield fail to disclose determining the vehicle velocity and operating the sensing system aid modules in response thereto. Applicants agree. The Office Action, however, states that it would have been obvious to combine the teachings of Okamoto with that of Shyu and Schofield to arrive at the claimed invention. Applicants traverse. Applicants submit that since Shyu and Schofield fail to teach or suggest each and every limitation of claim 14 that the stated combination would not allow one to arrive at the claimed invention.

Applicants further submit that it would not have been obvious to combine the teachings of Okamoto with that of Shyu and Schofield to arrive at the claimed invention. Okamoto discloses a vehicle speed sensor 5 that is used to determine a predicted vehicle route and an actual vehicle route, which are compared. The vehicle speed sensor is not used to determine whether a vehicle is traveling below a predetermined velocity, as claimed. Also, Okamoto like Shyu and Schofield fail to disclose sensing system aid modules and thus in none of the

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references is the operation of sensing system aid modules adjusted in response to vehicle speed disclosed, and especially not in response to whether the vehicle speed is below a predetermined value. Clearly vehicle speed sensors in and of themselves are known in the art and are used in various applications. However, the determination of whether a vehicle is traveling below a predetermined velocity and the operation of sensing system aid modules in response thereto is not known nor can it be inferred by merely referring to a reference that has a vehicle speed sensor. The operative use of a vehicle speed sensor and information collected therefrom can be quite different from application to application.

Thus, Applicants submit that none of the dependent limitations of claim 19 are taught or suggested by the combination of Shyu, Schofield, and Okamoto. Therefore, claim 19 is further novel, nonobvious, and allowable for the stated reasons.

Claim 20 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Schofield in view of Shyu.

The Office Action states that Schofield discloses a plurality of vision sensing systems 14 and 16. It appears that the Examiner is again confusing sensors or sensor elements with an actual sensing system. The devices referred to by numerical designators 14 and 16 are not vision sensing systems, but rather are sensors or image capture devices that are used as part of a single vision system.

The Office Action states that Schofield discloses operating in a plurality of modes as claimed. Applicants have shown that Schofield does not disclose operating in a parking-aid mode corresponding to both frontal and rearward detection, a frontal pre-collision sensing mode, a lane departure aid mode, or a lane-keeping aid mode. Thus, at most, one may argue that Schofield discloses operation in one of the modes recited in claim 20, specifically the reversing-aid mode, although the specifics thereof may be different. Thus, Schofield does not teach or suggest operating in two or more of the claimed modes.

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The Office Action also states that Schofield discloses a single vision processor comprising a plurality of sensing system aid modules. Applicants submit that Schofield simply discloses an image processor 18. Applicants are unable to find anywhere in Schofield any discussion with respect to the image processor having multiple modules. The Office Action fails to show such evidence of multiple module disclosure by Schofield. The image processor 18 is described throughout Schofield as operating in a single rearward viewing mode. This is expressed throughout Schofield. For example, see the first paragraphs of the summary of the invention and the detailed description sections of Schofield. In fact, the term "module" is never even recited in Schofield. The internal component(s) of the processor 18 are not stated or described.

Thus, since Schofield fails to teach or suggest multiple vision systems and multiple sensing system aid modules, the operation thereof in response to a transmission gear signal is also not taught or suggested.

The Office action states though it is not clear that the parking aid module of Schofield is corresponding to both frontal and rearward detection, one skilled in the art would have readily recognized that Schofield displays the result detection. Applicants traverse. The Schofield reference clearly fails to teach or suggest a parking-aid module, and the Office Action fails to provide any evidence for Applicants to believe otherwise. Schofield only discloses rearward detection this is stated throughout Schofield, and the Figures of Schofield only disclose rearward detection.

The Office Action states that Shyu discloses frontal and rearward detection. Applicants submit that this is irrelevant. Frontal and rearward detection on a highway is not that same as frontal and rearward detection during parking. For example, the zones, distances, and accuracies of the coverage for highway detection are different than they are for parking, which is further explained in the specification of the present application. Also, the types of sensors used and the tasks performed can also be different. Thus, Shyu, like Schofield, also fails to teach or suggest a parking-aid module.

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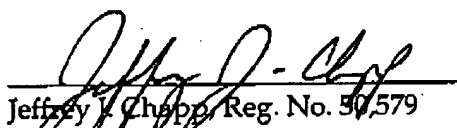
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Thus, Schofield and Shyu fail to teach or suggest each and every element of claim 20, therefore, claim 20 is novel, nonobvious, and is in a condition for allowance.

In light of the amendments and remarks, Applicants submit that all the objections and rejections are now overcome. The Applicants have added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, she is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

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